Sampling and Analysis Plan

Hardel Mutual Plywood Corporation
1210 West Bay Drive NW
Olympia, Washington

Prepared for:

West Bay Development Group LLC
8512 Canyon Road East
Suite 101
Puyallup, Washington 98371

Prepared using the City of Olympia's United Stated Brownfield Assessment Grant Funds,
Cooperative Agreement # BF01J66201

Prepared by:

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April 2020

Sampling and Analysis Plan Approval

The Sampling and Analysis Plan for Hardel Mutual Plywood Corporation has been approved by the following Project Team members:

Name and Role	Signature and Date
Susan Morales USEPA Project Manager	May 6, 2020
Donald M. Brown USEPA Brownfields QA Manager	
Mike Reid City of Olympia Grantee Project Manager	Mike Reid 4/30/20
Joel Hecker, LG PIONEER Project Manager	4/6/2020
Angela Noyan PIONEER QA Manager	4/6/2020

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List of Acronyms

Acronym	Explanation
bgs	Below Ground Surface
CAP	Cleanup Action Plan
City	City of Olympia
Ecology	Washington Department of Ecology
ESA	Environmental Site Assessment
Greylock	Greylock Consulting LLC
HREC	Historical REC
MTCA	Model Toxics Control Act
NAPL	Non-Aqueous Phase Liquid
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCP	Pentachlorophenol
PID	Photoionization Detector
PIONEER	PIONEER Technologies Corporation
Property	Hardel Mutual Plywood Corporation property
Prospective Purchaser	West Bay Development Group LLC
QAPP	Quality Assurance Project Plan
QC	Quality Control
RI/FS	Remedial Investigation/Feasibility Study
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RL	Reporting Limit
SAP	Sampling and Analysis Plan
SMS	Washington State Sediment Management Standards
SVOC	Semi-Volatile Organic Compound
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbon
TPH-G	TPH in the gasoline range
TPH-D	TPH in the diesel range
TPH-HO	TPH in the heavy oil range
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

SECTION 1: INTRODUCTION

PIONEER Technologies Corporation's (PIONEER's) project team prepared this Sampling and Analysis Plan (SAP) as a requirement of the United States Environmental Protection Agency (USEPA) brownfields grant program prior to using assessment grant funds for environmental assessment. The City of Olympia (City) intends to use its hazardous substances assessment grant (BF01J66201) funds on behalf of West Bay Development Group LLC (the prospective purchaser) to conduct an environmental assessment of the Hardel Mutual Plywood Corporation property, located at 1210 West Bay Drive NW, in Olympia, Thurston County, Washington (the Property). The general location of the Property is shown on Figure 1. The Property was determined to be eligible for the use of hazardous substance funds on February 20, 2020. The Quality Assurance Project Plan (QAPP) was submitted to USEPA and was approved on March 16, 2020.

The objective of the proposed environmental assessment is to evaluate current Property environmental conditions for the purpose of supporting environmental due diligence and liability management for a prospective purchase and redevelopment of the Property. Descriptions of the Property history and current environmental conditions; strategies and procedures for soil, groundwater, and soil vapor sampling; chemical analyses of collected soil, groundwater, and soil vapor samples; data evaluation and reporting; and the estimated project schedule are presented in the following sections.

SECTION 2: BACKGROUND INFORMATION

Summaries of the Property history, current Property conditions, and recognized environmental conditions (RECs) identified during a Phase I Environmental Site Assessment (ESA) of the Property completed on February 7, 2020 are presented in the following subsections. The Assessment Team's planned subsurface assessment activities to further evaluate the RECs are also summarized.

2.1 Property History

Logging and lumber related businesses began operating on the Property prior to 1924. Between 1924 and 1951, the Property was occupied by the Henry McCleary Timber Company, Olympia Harbor Lumber Company, Olympia Towing, and West Side Log Dump. From 1951 through 1996 the Property was occupied by Hardel Mutual Plywood Corporation as a plywood manufacturing facility. Hardel Mutual Plywood Corporation ended operations after a fire in 1996 severely damaged buildings on the Property. All buildings were subsequently demolished.

A series of investigations beginning in 2004 confirmed the presence of contamination, including (1) total petroleum hydrocarbons (TPH) in the diesel range (TPH-D) and heavy oil range (TPH-HO) in soil and groundwater, (2) non-aqueous phase liquid (NAPL) on the western portion of the Property, (3) polynuclear aromatic hydrocarbons (PAHs) in soil (northern portion of the Property) and in groundwater (southern portion of the Property), and (4) dioxins/furans and phthalates in off-shore sediment (Stemen Environmental 2004). In 2007, the Washington Department of Ecology (Ecology) issued an Agreed Order for completion of a Remedial Investigation/Feasibility Study (RI/FS) and interim action (e.g., cleanup) on the Property (Ecology 2007). The RI was completed in 2007 and the FS was completed in 2009 in compliance with Ecology's Agreed Order (Greylock Consulting LLC [Greylock] 2007, 2009a). The interim action consisted of NAPL removal and excavation and off-Property disposal of TPH- and PAH-impacted soils at concentrations exceeding Model Toxics Control Act (MTCA) Cleanup Levels for Unrestricted Land Use (Greylock 2009b). In 2010, approximately 23,331 tons of TPH- and PAH-impacted soil and debris was removed from three areas on the Property (Greylock 2010).

Between December 2010 and August 2011, four quarters of groundwater monitoring were completed on the Property to evaluate the effectiveness of the interim action cleanup. The results of the groundwater monitoring were compliant with MTCA Cleanup Levels for Unrestricted Land Use for TPH-D, TPH-HO, and PAHs (Greylock 2011). In 2012, Ecology issued the Final Cleanup Action Plan (CAP) (Ecology 2012a) and an Agreed Order Satisfaction letter (Ecology 2012b) stating that the Agreed Order had been satisfied. In the Final CAP, Ecology stated: "The interim action performed by Hardel completed all required cleanup of soil, groundwater and sediment at the Hardel Mutual Plywood Site."

Additionally, the Final CAP states: "Sediment containing phthalates and dioxins/furans are not associated with historic operations at this Site. Phthalates found in sediment [on] this Site are believed to have originated from residential neighborhoods to the West, having migrated by storm water, or from historic operations at the adjacent parcel to the South. Dioxins/furans were found at

concentrations ranging from 18 to 41 ng/kg in sediments at this Site. These dioxins/furans are believed to originate from an offsite source and are not known to have originated from historic operations on the uplands of this Site. There does not appear to be a direct linkage of dioxins/furans found in the intertidal sediment to the upland source area investigated in the remedial investigation of this Site. Dioxins/furans in sediments of Budd Inlet are believed to come from several upland sources including the former Cascade Pole facility."

The Agreed Order Satisfaction Letter reported that no additional remedial action was necessary at the Property unless new or different information become known (Ecology 2012b). The Property has been vacant land since the remedial activities were completed in 2010.

2.2 Current Conditions

As of the date of publication of this SAP, the western upland portion of the Property consists of vacant concrete-, asphalt-, crushed concrete-, shrub-, and grass-covered land; the remainder of the Property consists of intertidal and subtidal areas of Budd inlet. Budd Inlet adjoins the Property to the east. The Property was located in a mixed-use commercial and residential area west of downtown Olympia. The current Property features are shown on Figure 2.

2.3 Environmental Conditions

The following RECs associated with the Property were identified in the February 7, 2020 Phase I ESA for the Property (PIONEER 2020a):

- REC1: Fill material from an unknown source was used to expand the upland portion of the Property at various times over the past 150 years. The potential for environmental impact associated with the unknown origin and content of the fill material represents a REC in connection with the Property.
- REC2: The potential exists for the migration of environmental impact on to the Property through groundwater or soil vapor from historical uses of the south-adjoining former BMT Northwest/Reliable Steel site between at least 1941 and 2009. Historical uses of the site included boat building, steel fabrication, and welding as well as the presence of several underground storage tanks (USTs). Contaminants found above MTCA Cleanup Levels for Unrestricted Land Use and/or SMS included TPH in soil and sediment, metals (e.g., arsenic, cadmium, copper, lead, mercury, and zinc) in soil, groundwater, and sediment, PAHs in soil and sediment, polychlorinated biphenyls (PCBs) in soil, pentachlorophenol (PCP) in soil, and phthalates in sediment. No cleanup had been completed as of the publication date of this report.
- REC3: Off-shore sediment contains dioxins/furans and phthalates at concentrations exceeding Washington State Sediment Management Standards (SMS). Although Ecology has documented that historical uses of the Property were not responsible for dioxins/furans and phthalates in off-shore sediment, Ecology continues to investigate dioxins/furans in Budd Inlet sediment and could hypothetically change its position in the future.[1]

[1] The proposed assessment will focus on the upland portion of the Property and will not address this REC.

Due to the remedial actions and the results of post-remedial groundwater monitoring, the historical soil and groundwater contamination associated with industrial activities was not identified as a REC, but rather a Historical REC (HREC) in connection with the Property. The proposed sampling plan will also confirm that remediated soil and groundwater meet MTCA Cleanup Levels for Unrestricted Land Use.

2.4 Future Use of the Property

The anticipated future use of the Property will be used for mixed commercial and multi-family residential use.

2.5 Geologic Setting

The Property resides along Budd Inlet in Thurston County. Budd Inlet lies in the southern Puget lowlands which were subjected to multiple glaciations during the Pleistocene. Surface soils at the Property have been mapped as alluvium consisting of fine-grained flood plan deposits, marine alluvium, and artificial fill. Coastal bluffs to the west of the Property are comprised of glaciofluvial sands and gravels (Greylock 2007).

Upon review of boring logs, the subsurface of the Property consists of fill, marine sands, and varying amounts of wood from 0 to 25 feet below ground surface (bgs). In some areas poorly sorted gravel is present (Ecology 2012a).

Shallow groundwater at the site has been observed at depths ranging from 0.4 to 5 feet bgs. Although tidally influenced, the direction of groundwater flow at the Property is primarily towards Budd Inlet to the east (Ecology 2012a). At the northern portion of the site, the direction of groundwater flow is toward the east-northeast (Greylock 2011).

2.6 Susceptible Areas

Based on United States Fish and Wildlife National Wetland Inventory maps, the inter- and subtidal portion of the Property are designated as estuarine and marine wetland and estuarine and marine deep water. A small fringe along the northern and eastern boundary of the upland portion is designated as freshwater emergent wetland. West Bay Park is located approximately 1,100 feet to the south of the Property. The closest schools, Jefferson Middle School and Garfield Elementary School, are located approximately 1,300 feet to the west and southwest of the Property, respectively.

2.7 Conceptual Site Model

A simplified conceptual site model showing the possible pathways from sources through media and exposure scenarios to potential receptors is shown below.

Source of Concern	Primary Pathway	Secondary Pathway	Primary Receptors	Secondary Receptors	Primary Samples	Secondary Samples
Historic On-Site Operations and Fill Material	Direct Contact with Soil	Direct Contact with Groundwater	Future Residents/ Workers	Construction and Maintenance Workers	Soil Samples	Groundwater Samples
Migration from Off-Site Sources	Direct Contact with Groundwater	None	Future Residents/ Workers	Construction and Maintenance Workers	Groundwater Samples	None
Historic On-Site Operations and Fill Material and Migration from Off-Site Sources	Soil Migration to Groundwater to Surface Water	Groundwater Migration to Surface Water	Aquatic Receptors	Fish Consumption	Soil Samples	Groundwater Samples

2.8 Planned Site Assessment

The assessment activities described in this SAP are designed to evaluate the environmental conditions of the Property to support the following:

- Evaluate if upland contamination associated with REC1 and REC2 identified in the Phase I ESA is present.
- Confirm historical remedial actions (associated with the HREC) have removed soil contaminated at concentrations exceeding MTCA Method A/B Cleanup Levels for Unrestricted Land Use.
- If contamination is present, evaluate whether current environmental conditions warrant further investigation and/or remediation.

These Property assessment goals will be achieved through the following:

- Conducting limited subsurface activities to assess potential environmental impacts from historical use of the Property and surrounding sites, as identified during the Phase I ESA.
- If contamination is discovered, determine if regulated constituents are present at concentrations greater than MTCA Method A/B Cleanup Levels for Unrestricted Land Use.
- Generate sufficient data to determine if the future mixed commercial and multi-residential use could require remediation of soil, groundwater, and/or soil vapor (i.e., methane) to meet risk-based and regulatory goals.

This Phase II ESA includes spatial and temporal limitations. The spatial limit for this investigation consists of the Property boundary. The temporal limit is the season covered by the investigation since investigation results could vary based on seasonal weather changes. For the objectives of this Phase II ESA, temporal variation will not be assessed.

SECTION 3: SAMPLING PLAN

The sampling plan for the assessment activities is presented in this section. The sampling plan includes the following: 1) a summary of the planned soil, groundwater, and soil vapor sampling locations, 2) rationales for those locations, and 3) descriptions of procedures and methods for field sampling. A summary of the soil, groundwater, and soil vapor samples to be collected for this assessment is presented in Table 1 while sampling locations are shown on Figure 3.

3.1 Summary of Sampling Locations

PIONEER will advance 12 soil borings, including 6 with temporary monitoring wells and 3 with soil vapor probes, and will collect soil, groundwater, and soil vapor (methane only) samples, at the locations shown on Figure 3. The locations and number of sampling locations may change based on field conditions. Soil samples will be collected from each boring for visual classification, field screening, and potential laboratory analyses. PIONEER selected the sample locations to evaluate the RECs identified in the Phase I ESA and potential due care concerns related to the current and future planned uses of the Property. Specific sampling objectives and their respective sampling locations are discussed in the following paragraphs.

Soil borings B1 through B4 will be advanced along the edge of the Property's upland portion to characterize potential fill material (REC1). Each of the four borings will be advanced to a depth of 15 feet or five feet beyond the depth of first groundwater encountered, whichever is shallower, and will be converted to temporary monitoring wells. The temporary monitoring wells will assess remaining potential groundwater impact from historical operations (HREC). Soil samples will be retained from B1 and B3 only if evidence of fill material (e.g., debris) is present.

Soil borings B5 and B6 will be advanced along the southern perimeter of the Property to characterize potential fill material (REC1) and to assess potential migration of groundwater impact from the south-adjoining site (REC2). Both of the borings will be advanced to a depth of 15 feet or five feet beyond the depth of first groundwater encountered, whichever is shallower, and will be converted to temporary monitoring wells. Soil samples will be retained from B5 and B6 at the groundwater interface. A second soil sample will be retained from B5 and B6 only if evidence of fill material (e.g., debris) is present.

Soil borings B7 through B9 will be advanced to a depth of 10 feet bgs to assess potential remaining soil impact from historical operations (HREC). Soil boring B7 will be advanced in the center of former on-site operations. Soil boring B8 will be advanced adjacent to the reported location of the highest remaining TPH-D concentration in soil. Soil boring B9 will be advanced adjacent to the reported location of the highest remaining TPH-HO concentration in soil.

Soil vapor probes will be installed at sampling locations B10 through B12 to assess whether methane is a concern for future residential and commercial receptors. Subsurface methane may be present 1) in areas with significant quantities of fill material and wood debris, and 2) in areas with anoxic conditions in subsurface soil overlying shallow groundwater. These conditions suggest that it is possible that

methane could be present in the subsurface at the Property. The soil vapor probe locations on the Property were selected based on areas with previously identified wood debris. Soil samples will not be collected from these sample locations. Each of the three soil vapor probes will be installed two feet above the first encountered groundwater or at a maximum depth of six feet bgs, whichever is shallower. If groundwater is encountered at a depth less than four feet bgs, the soil vapor probes will not be installed.

3.2 Premobilization Coordination

Prior to beginning field work, the following will occur:

- Subcontracting with drillers and laboratories
- Completing required Health and Safety procedures for PIONEER and subcontractors
- Completing Public Utility Locate (i.e., 811)
- Obtain access agreement with Property owner
- Obtain sampling equipment and supplies

3.3 Sampling Procedures and Methods

Soil, groundwater, and soil vapor sampling, quality control (QC) sampling, and waste management procedures and methods are summarized in this subsection. Sampling activities will be conducted in accordance with the QAPP for the City, approved by USEPA, with subsequent updates as necessary (PIONEER 2020b).

3.3.1 Soil and Groundwater Sampling

PIONEER's field representative will collect soil and groundwater samples during sampling activities according to the methods described in SOP 1, Soil and Groundwater Sampling Using Direct-Push Methods, included in the QAPP. Details of sampling activities are described as follows:

- PIONEER's field representative will collect continuous soil samples from each boring, visually characterize them in the field, and note physical indicators of environmental contamination.
- PIONEER's field representative will field-screen the soil samples using a portable photoionization detector (PID) to identify the potential presence of volatile organic compounds (VOCs).
- PIONEER's field representative will collect soil samples for chemical analyses in accordance with the sampling design presented in Table 1.
- PIONEER's field representative will use the following criteria to determine one soil sample interval for chemical analyses in soil borings associated with the HREC. Where the PID results identify the potential presence of VOCs in a given boring, the interval with the highest reading will be selected for analyses. When there are no detectable PID results in a given boring, the following procedure and criteria will be used to determine the sample interval, in order of presentation:
    - If an interval has a specific odor that other intervals do not have, that interval will be selected for analysis.
    - If an interval has discoloration that does not appear to be the color of native soil, while other intervals appear to be the color of native soil, that interval will be selected for analysis.

  - In the absence of all indicators listed above within a given boring, the upper one-foot interval will be selected for analysis.
- For borings associated with REC1, PIONEER's field representative will collect a soil sample for analysis from a worst-case interval if signs of man-made impact (debris, obvious metals, other materials) are present in the boring in order to characterize fill material.
- For borings associated with REC2, PIONEER's field representative will collect a soil sample for analysis from a worst-case interval near the top of the groundwater interface.
- PIONEER's field representative will install and sample temporary, one-inch diameter, polyvinyl chloride (PVC) well assemblies fitted with five-foot long, pre-packed well screens in the open boreholes of B1 through B6 after soil samples are collected.
- PIONEER's field representative will collect the groundwater samples for chemical analyses from the temporary wells using a peristaltic pump at low-flow sampling rates, or a bailer. The sampling procedures will be consistent with those outlined in the QAPP.
- The driller will place purge water and soil cuttings generated back into their respective boreholes, fill the remaining space with hydrated bentonite, and restore the ground surface to match surrounding conditions.

The sample containers will be logged on the chain of custody, packaged for transportation, and transported to the laboratory for analysis.

3.3.2 *Methane Soil Vapor Sampling*

Methane will be evaluated at the Property using the guidance provided in ASTM E2993-16. Methane that is generated in the subsurface is typically positively pressurized which means that methane migration is predominantly driven by pressure driven flow, advection, and diffusion. This is different than typical vapor intrusion sites (e.g., dry cleaners) where movement of volatile organic compounds (VOCs), such as tetrachloroethylene, is driven by advection and diffusion. Consequently, one of the lines of evidence used in screening potential methane sites is whether or not positive pressure (with respect to atmospheric pressure) is present in the subsurface. Positive pressure indicates that methane gas (or other gas) is potentially being generated in the subsurface.

In addition, the concentrations of typical concern for methane are in the percent (volume/volume) versus parts per billion range for some VOCs. Consequently, the methods used to evaluate sites for methane are not as sensitive nor do they have to be as precise as typical vapor intrusion sites.

After installation, at least three volumes of air will be purged from each soil vapor probe using a GEM2000 landfill gas monitor. The soil vapor probes will be sealed with tape or rubber caps for at least four hours. After a minimum of four hours, PIONEER's field representative will use the GEM2000 to purge soil vapor for an additional 15 minutes, while documenting the concentrations of methane, oxygen, carbon dioxide, and differential pressure at each location. Atmospheric pressure will also be recorded. PIONEER will record the methane monitoring field data and conditions (e.g., personnel, weather, etc.) during the sampling event to assist with redevelopment planning.

3.3.3 Quality Assurance and Quality Control

PIONEER's field representative will minimize the potential for cross-contamination by using new, disposable, nitrile sampling gloves for collection of each sample; using new polyethylene and/or silicone sample tubing for collection of each groundwater and soil vapor sample; decontaminating soil sampling equipment before each use; and, calibrating field instruments in accordance with manufacturer's instructions.

PIONEER's field representative will collect field QC samples as described in SOP 6, Field Quality Control Samples, included in the project QAPP and as summarized in Table 1. The sample handling and custody requirements, laboratory analytical methods, target reporting limits (RLs), and reporting protocols will be consistent with those outlined in the project QAPP.

3.3.4 Waste Management

We will manage investigation derived wastes as described in SOP 12, Investigative Derived Wastes, included in the project QAPP. Purge water and soil cuttings will be placed back into their respective boreholes.

SECTION 4: ANALYSIS PLAN

The target constituents for the soil and groundwater samples were selected based on the project goals and the suspected historical chemical use at the Property and adjoining sites.[2] The specific constituents for each sampling location are presented in Table 1. The target constituents for the assessment will include VOCs, TPH-gasoline (TPH-G), TPH-D, TPH-HO, PAHs, semi-volatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) metals (arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver), hexavalent chromium, and total organic carbon (TOC). Laboratory analyses and field screening will be performed as described in the project QAPP. Samples will be submitted to Libby Environmental in Olympia, Washington for shipment to a subcontracted laboratory, per the QAPP, or analyzed using the following referenced methods:

- VOCs - USEPA Method 8260B
- TPH-G, TPH-D, and TPH-HO - Ecology Method NWTPH-HCID followed by Ecology Method NWTPH-Gx and Dx
- SVOCs/PAHs - USEPA Method 8270LVI
- Metals – USEPA Methods 6020, 7196, and 7470/7471
- TOC – USEPA Method 9060

Laboratory testing, analysis method target RLs, quality assurance/QC procedures, and reporting protocols used or performed by the laboratories will be consistent with those described in the project QAPP and the needs of the project. Laboratory analytical results will be compared to MTCA Method A/B Cleanup Levels for Unrestricted Land Use.

[2] Soil vapor will be analyzed in the field for methane. No additional soil vapor analyses is planned.

SECTION 5: DATA EVALUATION AND REPORTING

Data collected during this Property assessment will be evaluated as described in Section 4.0 – Data Verification/Validation and Usability of the project QAPP (PIONEER 2020b). Following data review, verification, and validation, PIONEER will prepare a Phase II ESA report summarizing the results. The report will include details of the activities performed, procedures followed, chemical analyses results, and recommendations. The reports will include a sampling location diagram, tabulated analytical results, soil boring logs, a copy of the laboratory analytical report for all samples collected, and a copy of the chain-of-custody records.

SECTION 6: ESTIMATED SCHEDULE

The environmental activities described in this SAP are to be implemented according to the schedule presented below. This schedule is in weeks relative to EPA approval of the SAP.

- Field Sampling: Week 4
- Laboratory Analyses: Week 5 through Week 6
- Data Evaluation and Reporting: Week 8 through Week 12

The Coronavirus Pandemic may delay this schedule.

SECTION 7: REFERENCES

Ecology. 2007. Hardel Mutual Plywood, Inc., Agreed Order for Remedial Investigation, Feasibility Study, and Interim Actions. April.

Ecology. 2012a. Final Cleanup Action Plan. Hardel Mutual Plywood. April.

Ecology. 2012b. Satisfaction of Agreed Order No. DE4108: Hardell Mutual Plywood. August.

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Stemen Environmental, Inc. 2004. Phase II ESA Report, Former Hardel Mutual Plywood Waterfront Property. July.

PIONEER. 2020a. Phase I Environmental Site Assessment for the Hardel Mutual Plywood Corporation, Olympia, Washington. February.

PIONEER. 2020b. Quality Assurance Project Plan for the City of Olympia's Brownfield Assessment Grant. March.

Figures

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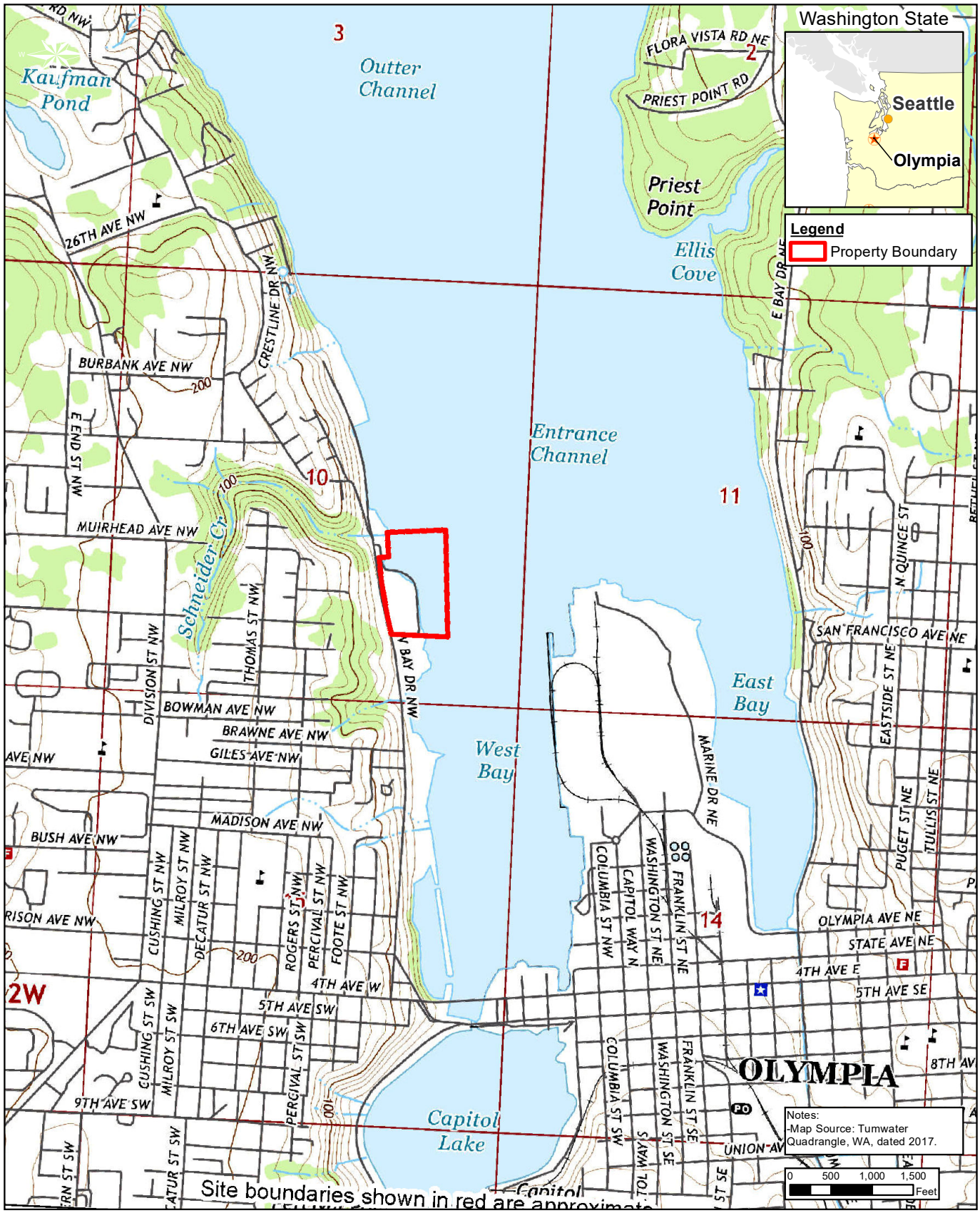

PIONEER TECHNOLOGIES CORPORATION

Property Location Map
Hardel Mutual Plywood Corporation
Sampling and Analysis Plan
1210 West Bay Drive NW
Olympia, WA

Figure 1

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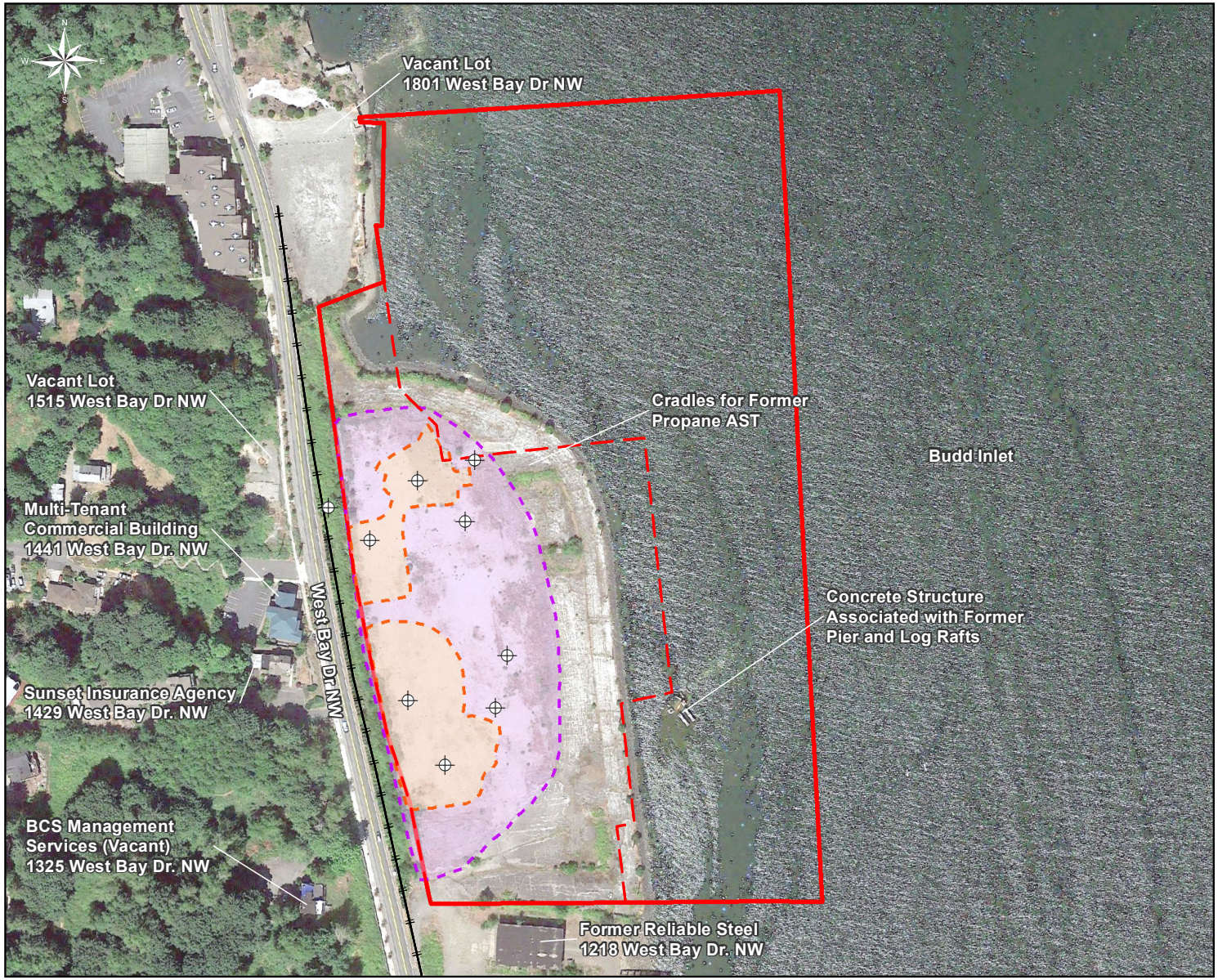

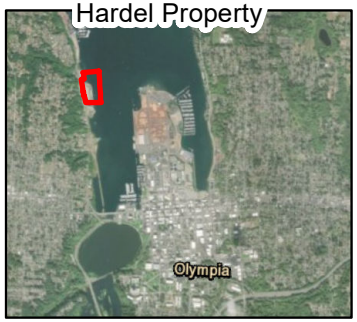

Legend

Reported Locations of Monitoring Wells (not located during Property Reconnaisance)

Cleanup Actions

Extent of Clean Crushed Concrete Cover

Extent of Remedial Excavations

Site Features

Abandoned Rail Spur

Parcel Boundary

Property Boundary

Notes:
-Features shown are approximate.
-Aerial photo obtained from Google Earth dated 7/21/2018.
-Locations of remedial excavations, clean crushed concrete cover, and monitoring wells obtained from Ecology's March 2012 Draft Cleanup Action Plan Fact Sheet.

0 100 200 300 Feet

PIONEER TECHNOLOGIES CORPORATION

Current Property Features Diagram
Hardel Mutual Plywood Corporation
Sampling and Analysis Plan
1210 West Bay Drive NW
Olympia, WA

Figure 2

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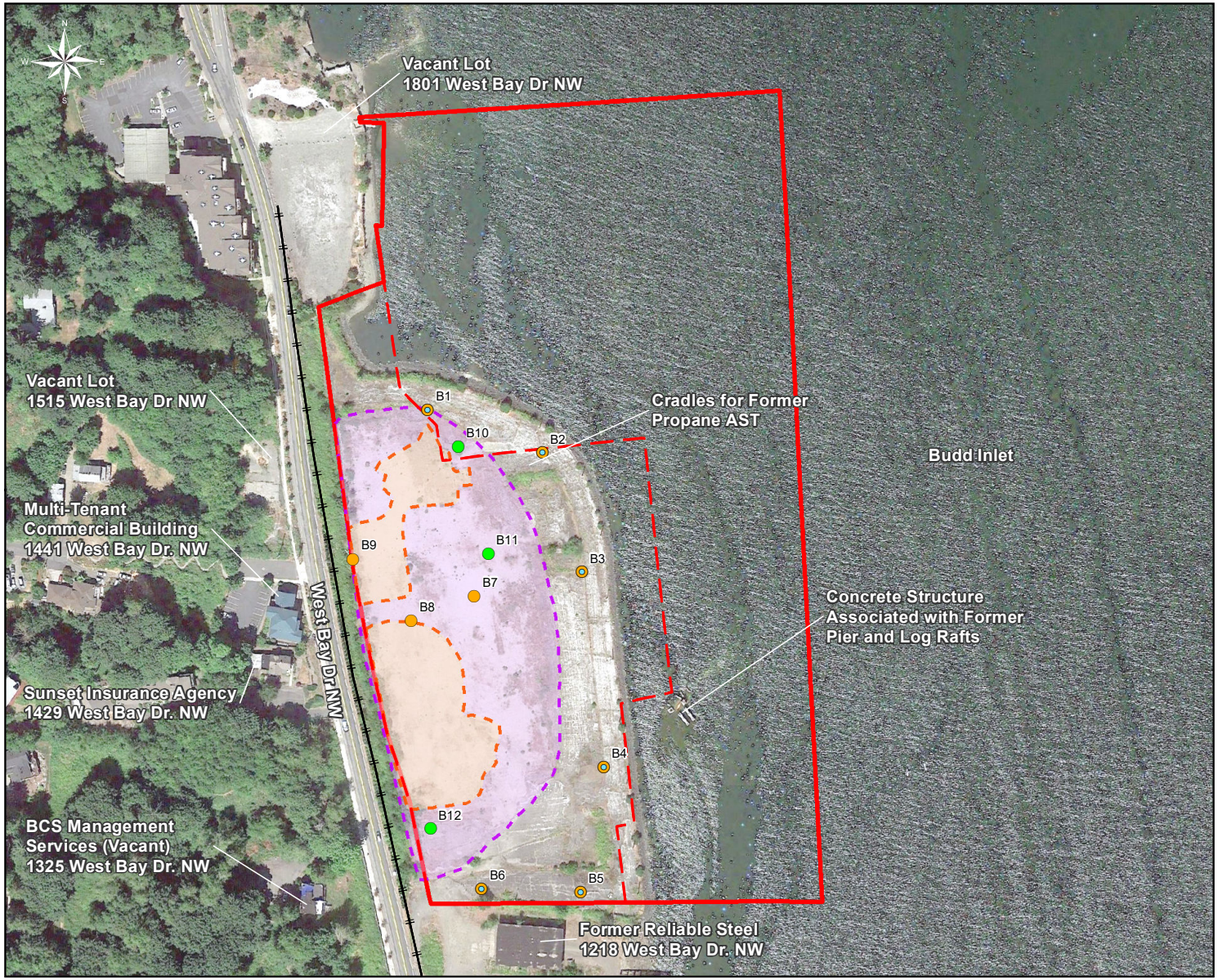

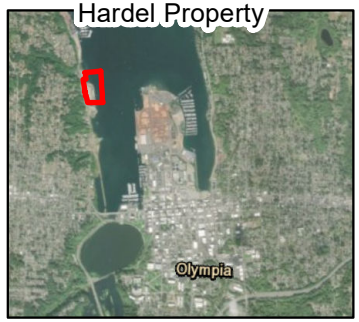

Legend

Proposed Sample Location
- Soil Sample
- Soil Vapor Sample
- Soil and Groundwater Sample

Cleanup Actions
- Extent of Clean Crushed Concrete Cover
- Extent of Remedial Excavations

Site Features
- Abandoned Rail Spur
- Parcel Boundary
- Property Boundary

Notes:
-Features shown are approximate.
-Aerial photo obtained from Google Earth dated 7/21/2018.
-Locations of remedial excavations, and clean crushed concrete cover from Ecology's March 2012 Draft Cleanup Action Plan Fact Sheet.

0 100 200 300 Feet

PIONEER TECHNOLOGIES CORPORATION

Proposed Sampling Location Diagram
Hardel Mutual Plywood Corporation
Sampling and Analysis Plan
1210 West Bay Drive NW
Olympia, WA

Figure 3

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Tables

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Table 1: Proposed Sampling Design

Boring ID	Boring Location Note[1]	Estimated Boring Depth (in feet bgs)	Media	Sample Purpose	Contingent Sample?	Constituents							
						VOCs	TPH-G, D, and HO (w/o SGC)[2]	PAHs	SVOCs	RCRA8 Metals[3,4]	Methane[5]	TOC[6]	Cr VI[6]
B1	Downgradient of historical operations	15	Soil	Characterize potential fill materials (e.g., debris), if encountered (REC1).	Yes	1	1	1		1		2	2
			GW	Characterize potential remaining impact from historical operations (HREC).	No	1	1		1	1			
B2	Downgradient of historical operations	15	Soil	Characterize fill materials (REC1).	No	1	1	1		1			
			GW	Characterize potential remaining impact from historical operations (HREC).	No	1	1		1	1			
B3	Downgradient of historical operations	15	Soil	Characterize potential fill materials (e.g., debris), if encountered (REC1).	Yes	1	1	1		1			
			GW	Characterize potential remaining impact from historical operations (HREC).	No	1	1		1	1			
B4	Downgradient of historical operations	15	Soil	Characterize fill materials (REC1).	No	1	1	1		1			
			GW	Characterize potential remaining impact from historical operations (HREC).	No	1	1		1	1			
B5	Adjacent to Reliable Steel	15	Soil	Characterize potential fill materials (e.g., debris), if encountered (REC1).	Yes	1	1	1		1			
				Characterize potential impacts from off-property at GW interface (REC2).	No	1	1		1	1			
			GW	Characterize potential impacts from off-property (REC2).	No	1	1		1	1			
B6	Adjacent to Reliable Steel	15	Soil	Characterize potential fill materials (e.g., debris), if encountered (REC1).	Yes	1	1	1		1			
				Characterize potential impacts from off-property at GW interface (REC2).	No	1	1		1	1			
			GW	Characterize potential impacts from off-property (REC2).	No	1	1		1	1			
B7	Center of former Site operations	10	Soil	Characterize potential remaining impact from historical operations (HREC).	No	1	1		1	1			
B8	Adjacent to highest remaining TPH-D in soil (at 4' depth)	10	Soil	Verify maximum remaining TPH-D concentration (HREC).	No	1	1	1					
B9	Adjacent to highest remaining TPH-HO in soil (at 6' depth)	10	Soil	Verify maximum remaining TPH-HO concentration (HREC).	No	1	1	1					
B10	Northern upland portion to evaluate methane buildup[5]	6	Vapor	Verify methane concentrations due to potential degradation of organic material in fill.	No						1		
B11	Central upland portion to evaluate methane buildup[5]	6	Vapor	Verify methane concentrations due to potential degradation of organic material in fill.	No						1		
B12	Southern upland portion to evaluate methane buildup[5]	6	Vapor	Verify methane concentrations due to potential degradation of organic material in fill.	No						1		
Field QC Samples[7]			Soil	Field duplicate	No	1	1		1	1			
			GW	Field duplicate	No	1	1		1	1			
			Soil	Equipment rinsate blank	No	1	1		1	1			
			GW	VOC trip blank	No	1							
					Sample Count	21	20	8	12	18	3	2	2

Table Notes:

bgs: below ground surface, VOCs: volatile organic compounds, TPH-D, G, and HO: total petroleum hydrocarbons in the gasoline, diesel, and heavy oil range, SGC: silica gel cleanup, PAHs: Polynuclear Aromatic Hydrocarbons, SVOCs: semi-volatile organic compounds, RCRA8 Metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver, TOC: total organic carbon, Cr VI: hexavalent chromium, GW: groundwater, QC: quality control.

[1] Boring locations will be adjusted as necessary in the field based on overhead power lines, underground utilities, etc.

[2] Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH) will also be collected for each sample to potentially run on the most contaminated samples (if TPH contamination is encountered). This may be used to develop site-specific Method B TPH Cleanup Levels for Unrestricted land Use.

[3] All groundwater samples for metals analyses will be field filtered with a 0.45-micron filter.

[4] RCRA8 metals include arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver.

[5] Methane will be evaluated in the field using a GEM 2000 Landfill Gas Monitor. Oxygen, carbon dioxide, and differential pressure will also be recorded. Samples will not be submitted to the laboratory.

[6] All soil samples will be held for possible TOC and Cr VI analyses. Two lithologically representative samples that do not have detections of organic compounds will be analyzed for TOC. If the maximum Cr concentration exceeds 48 mg/kg, the two samples with the highest Cr concentration will be analyzed for Cr VI.

[7] Frequency expectations for field QC samples will be one sample per 20 samples per matrix (except VOC trip blanks will be one sample per cooler). No aqueous equipment blank is needed as each sample will be collected with clean dedicated equipment.

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